AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-33. (canceled)

34. (previously presented) The method according to claim 43, wherein one or both of the probe ends have at least two branches, and a detectable function is provided on each of the branches on one end part of said probe, the detectable functions being different and distinguishable from each other.

35. (previously presented) The method according to claim 43, wherein one probe end is linear and the other probe end is branched.

36-37. (canceled)

38. (previously presented) The method according to claim 44, wherein said probe is designed to hybridize to the target nucleic acid sequence in step (b) to leave an interspace between the probe ends, at least one additional probe is provided which is designed to hybridize to the target nucleic acid sequence in said interspace, and said additional probe is covalently connected to the ends of the hybridized probe in step (c).

39. (previously presented) The method according to claim 44, wherein said probe is designed to hybridize to the

target nucleic acid sequence in step (b) to leave at least one small gap between adjacent probe ends, and said gap is filled by an extension reaction prior to covalently connecting the probe ends in step (c).

40. (previously presented) The method according to claim 44, wherein said covalently connecting the probe ends is performed by enzymatic, ribozyme-mediated or chemical ligation.

41. (previously presented) The method according to claim 44, wherein said target nucleic acid is a DNA or RNA sequence.

42. (currently amended) The method according to claim 44, wherein said solid phase anchor is biotin and said oligonucleotide probe is immobilized via the biotin to a streptavidin-coated solid phase.

43. (previously presented) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe immobilized to a solid support, the immobilized probe comprising two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is provided with a solid phase anchor by which the probe is immobilized to the support and wherein the other end part comprises at least one detectable function provided on a dissociable part of said probe,

b) contacting the immobilized probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of the immobilized probe to hybridize to at least substantially neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of the hybridized oligonucleotide probe to each other to form a circularized structure;

d) dissociating said dissociable part;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes connected by catenation to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be de-connected from the immobilized probe by said dissociating;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not connected by catenation to the other probe part comprising the solid phase anchor, and hence is not connected to the support, and can be de-connected from the immobilized probe by said dissociating;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the target nucleic acid sequence by detecting the presence, and optionally, quantity and/or location of the connected detectable function, and

wherein said probe comprises two padlock probes and said dissociable part is one of said padlock probes, hybridizing to the other padlock probe which carries said solid phase anchor and hybridizes to the target nucleic acid sequence in step b).

44. (previously presented) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe immobilized to a solid support, the immobilized probe comprising two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is provided with a solid phase anchor by which the probe is immobilized to the support and wherein the other end part comprises at least one detectable function provided on a dissociable part of said probe,

b) contacting the immobilized probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of the immobilized probe to hybridize to at least substantially neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of the hybridized oligonucleotide probe to each other to form a circularized structure;

d) dissociating said dissociable part;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes connected

by catenation to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be de-connected from the immobilized probe by said dissociating;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not connected by catenation to the other probe part comprising the solid phase anchor, and hence is not connected to the support, and can be de-connected from the immobilized probe by said dissociating;

e) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

f) detecting the target nucleic acid sequence by detecting the presence, and optionally, quantity and/or location of the connected detectable function, and

wherein said probe comprises two padlock probes and said dissociable part is one of said padlock probes, which hybridizes to the target nucleic acid sequence in step (b) and to the other padlock probe carrying said solid phase anchor.

45. (canceled)

46. (currently amended) A method, wherein a target nucleic acid sequence is detected, comprising the following steps:

a) providing an oligonucleotide probe, said probe comprising two end parts having at least one 3'-end sequence and at least one 5'-end sequence, wherein one of said end parts is

provided with a solid phase anchor for immobilization of said probe to a solid support and wherein the other end part comprises at least one detectable function and a cleavable site which lies between the detectable function and the solid phase anchor,

b) contacting the probe with a target nucleic acid sequence allowing the 3'-end and the 5'end of said probe to hybridize to at least substantially neighboring regions of said target nucleic acid sequence under hybridizing conditions;

c) covalently connecting the ends of any hybridized oligonucleotide probe to each other to form a circularized structure;

d) immobilising said probe to a solid support by means of said solid phase anchor (i) before step b) or (ii) between steps c) and e);

(e) cleaving the circularized and non-circularized oligonucleotide probe at the cleavable site between the detectable function and the solid phase anchor;

so that if said probe is circularized in step c), the probe part comprising the detectable function becomes covalently connected to the other probe part comprising the solid phase anchor and thereby connected to the support, and cannot be de-connected from the immobilized probe part by said ~~part~~ cleaving;

but wherein if said probe is not circularized in step c), the probe part comprising the detectable function is not covalently connected to the other probe part comprising the solid

phase anchor, and hence is not covalently connected to the support, and can be de-connected from the immobilized probe part by said cleaving;

(f) separating non-connected detectable functions from the solid support by washing under denaturing conditions;

(g) detecting the target nucleic acid sequence by detecting the presence, and optionally, quantity and/or location of the connected detectable function, and

wherein said cleavable site is a disulphide or a deoxyuridine residue or a peptide residue or a nucleotide sequence susceptible to cleavage by endonuclease, wherein in step e), said cleaving of the oligonucleotide probe takes place using a cleaving agent being a reducing agent, a uracil DNA glycosylase, a peptidase or an endonuclease, respectively.